

CLAIMS

1. A method of detecting local space-time details of a video signal representing a plurality of images, the method comprising, for each image, the steps of:
 - A) dividing the image into one or more blocks of pixels,
 - 5 B) calculating at least one space-time feature for at least one pixel within each of said one or more blocks,
 - C) calculating for each of the one or more blocks at least one statistical parameter for each of the at least one space-time features calculated within the block, and
 - D) detecting blocks wherein the at least one statistical parameter exceeds a 10 predetermined level.
2. A method according to Claim 1, wherein the at least one space-time feature is selected from a group consisting of: visual normal flow magnitude, visual normal flow direction.
3. A method according to Claim 1, wherein the at least one space-time feature is 15 selected from a group consisting of: visual normal acceleration magnitude, and visual normal acceleration direction.
4. A method according to Claim 1, wherein the at least one statistical parameter of step D) is selected from a group consisting of: variance, average, and at least one parameter of a probability function.
- 20 5. A method according to Claim 1, wherein the one or more blocks of pixels are one or more non-overlapping square blocks, and wherein a size of the one or more square blocks is selected from a group consisting of: 2x2 pixels, 4x4 pixels, 6x6 pixels, 8x8 pixels, 12x12 pixels, and 16x16 pixels.
6. A method according to Claim 1, further comprising the step of pre-processing the 25 image prior to applying step A), so as to reduce noise in the image.
7. A method according to Claim 6, wherein the step of pre-processing comprises convolving the image with a low-pass filter.

8. A method according to Claim 1, further comprising an intermediate step between step C) and D), wherein the intermediate step comprises calculating at least one inter-block statistical parameter involving at least one of the statistical parameter calculated for each block.

5 9. A method according to claim 8, wherein the at least one inter-block statistical parameter is calculated using a 2-D Markovian non-causal neighbourhood structure.

10. A method according to Claim 1, further comprising the step of determining a pattern of temporal evolution for each of the at least one statistical parameter calculated in step C).

11. A method according to Claim 1, further comprising the step of indexing at least part
10 of an image comprising one or more blocks detected in step D).

12. A method according to Claim 1, further comprising the steps of calculating horizontal and vertical histograms of the at least one space-time feature calculated in step C).

13. A method according to Claim 1, further comprising the step of increasing data rate allocation to the one or more blocks detected in step D).

15 14. A method according to Claim 1, further comprising the step of inserting an image in a de-interlacing system.

15. A system for detecting local space-time details of a video signal representing a plurality of images; the system comprising:

- means for dividing an image into one or more blocks of pixels,

20 - space-time feature calculating means for calculating at least one space-time feature for at least one pixel within each of the one or more blocks,

- statistical parameter calculating means for calculating for each of the one or more blocks at least one statistical parameter for each of the at least one space-time features computed within the one or more blocks, and

25 - detecting means for detecting one or more blocks wherein the at least one statistical parameter exceeds a predetermined level.

16. A device comprising a system according to Claim 15.

17. A signal processor system programmed to operate according to the method of Claim 1.

18. A de-interlacing system for a television (TV) apparatus, the de-interlacing system operating according to the method of Claim 1.

19. A video signal encoder for encoding a video signal representing a plurality of images, the video signal encoder comprising:

- means for dividing an image into one or more blocks of pixels,

- space-time feature calculating means for calculating at least one space-time feature for at least one pixel within each of the one or more blocks,

- statistical parameter calculating means for calculating for each of the one or more blocks at least one statistical parameter for each of the at least one space-time features computed within the one or more blocks,

- means for allocating data to the one or more blocks according to a quantisation scale, and

- means for adjusting the quantisation scale for the one or more blocks in accordance with the at least one statistical parameter.

20. A video signal representing a plurality of images, the video signal comprising information regarding image segments exhibiting space-time details suitable for use with the method of Claim 1.

25 21. A video storage medium comprising video signal data according to Claim 20.

22. A computer useable medium having a computer readable program code embodied therein, the computer readable program code comprising:

30 - means for causing a computer to read a video signal representing a plurality of images,

- means for causing the computer to divide a read image into one or more blocks of pixels,

- means for causing the computer to calculate at least one space-time feature for at least one pixel within each block,

- means for causing the computer to calculate for each of the blocks at least one statistical parameter for each of the at least one space-time features calculated within the one or more blocks, and

- means for causing the computer to detect blocks wherein the at least one statistical parameter exceeds a predetermined level.

23. A video signal representing a plurality of images, the video signal being compressed according to a video compression standard, such as MPEG or H.26x, comprising a specified individual allocation of data to blocks of each image, wherein a data rate allocated to one or more selected blocks of images exhibiting space-time details is increased compared to the specified allocation of data to the one or more selected blocks.

10 24. A method of processing a video signal, wherein the method of processing comprises the method of Claim 1.

25. An integrated circuit comprising means for processing a video signal according to the method of Claim 1.

15 26. A program storage device readable by a machine and encoding a program of instructions for executing the method of Claim 1.